Mihaela Gheorghiu, PhD. Habil.
International Centre of Biodynamics, 1B, Intrarea Portocalelor, 060101
Bucharest, Romania

Married (previous name Mehedintu)

Education

2018	University of Bucharest, Faculty of Biology	Biology	Habilitation
1998-2003	University of Bucharest, Faculty of Biology	Biology	PhD in Biology
1994-1995	University of Bucharest, Faculty of Physics	Biophysics	MSc Biophysics
1989-1994	University of Bucharest, Faculty of Physics	Physics/Biotechnology	Physicist Eng.

Professional Experience

2019-present – Doctoral School Biology, University of Bucharest, PhD student supervisor

2010-present – Coordinator of the Analysis Department within ICB comprising SPR analyses, Optical analyses (fluorescence microscopy), and between 2010-2014 of the Water analysis laboratory, Accredited.

2001-present Scientific Researcher International Centre of Biodynamics, Bucharest, Romania; *since 2004* Senior Researcher 1st degree.

Sept 2005 – Visiting Scientist National University of Singapore, Singapore

2002-2003 – PostDoctoral Researcher, Catholic University of Leuven, Belgium, Physiology

1997 – 2000 Biophysicist (since 1998 Senior Researcher*)* R&D National Institute of Biotechnology (NIBT) – UNESCO Centre for Biodynamics, Bucharest

July 1996–Nov 1996 Research Associate, Institute for Molecular Biotechnology, Jena, Germany

1994-1997 Biophysicist, R&D National Institute of Biotechnology, Bucharest, Romania

Research Interests: Surface Plasmon Resonance (with applications in monitoring bio-affinity reactions); TIRFM (visualization of processes at cellular and subcellular levels, and fluorescence quantitative evaluation of model-systems e.g., model cells, liposomes and fluorescent nanobeads); Combination of SPR, TIRFM and impedance by development of surfaces with controlled design and study of their interactions with biological cells for detection and imaging; Analysis of cell adhesion to functionalized substrates; Set-up development for SPR and impedance assessment of cellular platforms.

Synergistic Activities

■ Expert Evaluator Horizon 2020: HORIZON-CL4-2023-DIGITAL-EMERGING-01, FETProact Biotechnology 2016; People, Chemistry, Life Sciences panels since 2014-present

■ Expert Evaluator FP7 People, Chemistry panel 2013, Life sciences panel 2009

■ Member of the Organizing team of International Conferences and Workshops: IInd EURYIAS 2008 International symposium on Self-Organization and Selection in Evolution of Matter, Molecules and Life Bucharest, 2008- Biodynamics: ways and means to appraise the impact of gentle stimuli on selected biological/cellular system; International Conference Biosensing and Biodynamics: From Basics to Applications 18-21 May 2006 ICBB 2006- "Biodynsensing, Sensing through dynamics of (bio)interfaces & cellular platforms;

■ Member of the Program Committee ESOF2008 (Barcelona)
■ Chair of 1E Stream 31th World Congress on Biosensors, 26-29 July 2021 Online and On-demand
■ Reviewer for Biosensors & Bioelectronics, Plasmonics, Sensors, Archives of Medical Research, Talanta, Lab Chip, J Mat Chem B, Plasmonics, Chem Comm, Anal Chim Acta, Materials
■ Guest editor special issue Materials (2020)
■ Review Editor Frontiers in Bioengineering and Biotechnology – Nanobiotechnology (2021)
Review Editor Frontiers in Bioengineering and Biotechnology - Biosensors and Biomolecular Electronics (2022)

■ **Teaching Accomplishments:**
- Course "Actual Methods for assessment of biosurfaces" (2007-2008) within the Master of Biodynamics from the Faculty of Biology, University of Bucharest
- Course (2019-2022 – Biodynamics for Biomedical Applications) within Master "Tehnologii moderne pentru Ingineria Medicală" Polytechnic University, Bucharest.
- Supervisor of 3 PhD students: R. Munteanu/Cartoc PhD student within ICB (2020), D. Tudor PhD student within ICB (2021), V. S. Ionescu student within Fundeni Institute (2024).
- Technical supervision of 5 PhD students within ICB: S. David, C. Polonschii, A. Olaru, M. Axinie, L.Stanica and 3 Master students Lázaro Arturo Góngora Hernández, Loredana Antonescu, Calin Mircea Rusu

■ **Collaborations**: Prof. Gabriel Popescu (Urbana, USA)†, Prof. H. Girault (EPFL, Switzerland), Prof. T. Wohland, (NUS, Singapore), Prof. C. Supuran (U. Florence, Italy), Prof. P. Wagner (Limburgs Universitair Centrum, Belgium); Prof. W Van Driesche (KU Leuven, Belgium); Prof. J.-L. Marty (University of Perpignan, France); Prof. M. Barboiu, (Montpellier University, France); Prof. S. Andreescu (Clarkson University, USA).

Fellowships:
2024 Biophotonics summer school, University of Illinois Urbana-Champaign 28 May -07 June 2024, Center for Label-free Imaging and Multiscale Biophotonics (CLIMB)
2005 *Eastern Europe Research Scientists* & *Students Exchange* & *Collaboration Programme* National University Singapore
2002, 2003 Postdoctoral stages Dept. of cell physiology, Catholic University Leuven, Belgium
1996 Boehringer Ingelheim, Research stage at Institute for Molecular Biotechnology, Jena, Germany

Prizes and Awards:
•2022 - "Grigore Antipa" **Prize of the Romanian Academy,** Biology Section, for 2020, group of papers
•2007 –Turner Luminometer 20/20n Grant.
•Nov 2004 – Silver medal "Method to pinpoint the presence of some analytes in liquid solutions" World Exhibition of Innovation, Research and Technology, EUREKA, Bruxelles;

•June 2003 – Second Prize for postdoc presentation EURESCO (European Research Conference "Biological Surfaces and Interfaces" - Castelvecchio Pascoli, Italy).
•Oct 2000 - Second prize for poster presentation from Single Cell Research Foundation (EMBO Lecture Course Molecular and Cellular Biology from Plant to Human Cells September-October 2000-, Debrecen, Hungary).

Granted patent(s)

[1] RO patent no. 117877/30.09.2004: "Method for detecting target analytes in liquid media";
[2] RO patent no. 117986/30.09.2004: "Fast, high accurate method to measure impedances in ac sinusoidal current";
[3] RO patent no. 120867/30.08.2007: "Quantitative assessment of (bio)sensors by analysis of nonlinear frequency response";
[4] RO patent no. 120790/30.08.2007: „Method for determining analytes by analyzing the polarization impedance of the transducer/ sample interface".
[5] RO patent no. 132361/28.02.2023 - "Metodă si dispozitiv de iluminare și recepție pentru aplicații de microscopie care utilizează reflexia totală internă", Authors: E. Gheorghiu, R. Dabu, D. Ursu, M. Gheorghiu, M. S. David, C. Polonschii, D. Bratu
[6] RO patent no. 133203/30.05.2025 - "Metodă de determinare cu precizie a amplitudinii unui semnal format din pulsuri repetitive dreptunghiulare și a decalajelor temporale ale unui semnal format din pulsuri repetitive distorsionate, față de pulsuri de referință", Authors: Gheorghiu E., David S, Gheorghiu M., Bratu D.
[7] RO patent no. Ro133858/28.03.2025 - Metoda si Dispozitiv de măsurare cu precizie a variaţiei periodice a impedanţei electrice a unei probe", Authors: E. Gheorghiu, R. Dabu, D. Ursu, M. Gheorghiu, M. S. David, C. Polonschii, D. Bratu

[8] US Patent US 11,680,939 B2, Systems and methods for detecting bioactive compunds using sensors with pre-stimulated cells, Authors: M. Gheorghiu, E. Gheorghiu**.**
[9] US Patent US 11,733,323 B2, Systems and Methods for measuring cellular response to target analytes by controlled application of an oscillating stimulus, Authors: E. Gheorghiu, M. S. David, M. Gheorghiu

Patent applications

1. Ro Patent Application A/00335/15.06.2022, Method and device for increasing the yield and online monitoring the capture of target analytes and assess their concentration, Authors: E. Gheorghiu, M. S. David, M. Gheorghiu, D. Bratu
2. Ro Patent Application A/00224/2019, Method to measure the phase difference and the intensity introduced by the sample on beams with controlled polarization in a common-path geometry, Authors: E. Gheorghiu, M. S. David, M. Gheorghiu, C. Polonschii
3. Ro Patent Application A/00420/2018, Method and system for detection of bioactive compounds e.g. cytotoxic, using sensors with stimulated cells, Authors: M. Gheorghiu, E. Gheorghiu
4. Ro Patent Application A/00421/2018, Method for detection and quantitation of target analytes as well as for monitoring and increasing the yield of analyte capturing using a periodic stimulus, Authors: E. Gheorghiu, M. S. David, M. Gheorghiu

5. Ro Patent Application A/00422/2018, Method for assessing the viability of biological cells and for testing their susceptibility when exposed to a compound (e.g. antibiotic), Authors: E. Gheorghiu, M. S. David, M. Gheorghiu
6. Ro Patent Application A/00423/2018, Method and system for high precision measurement of the periodic variations of the electrical impedance of a sample, Authors: E. Gheorghiu, M. S. David, D. Bratu, M. Gheorghiu, C. Polonschii
7. Ro Patent Application A0031/2018: Portable device to measure optical waveguides including their resonances, Authors: E. Gheorghiu, M. S. David, M. Gheorghiu, C. Polonschii
8. Ro Patent Application A00651/2017: Method for measuring the distributions of electric fields and of refractive indices with high spatial and temporal resolution, Authors: E. Gheorghiu, M. S. David, C. Polonschii, M. Gheorghiu

Publications: 5 book chapters (Springer, ACS, Springer, Elsevier), 43 ISI publications (38 papers: Total IF 151 since 2012, 5 abstracts), 13 articles in peer-reviewed journals/books conference proceedings, 15 published in Proceedings of international scientific Conferences, 7 published in proceedings of Romanian scientific events with international participation, 1 book (Romanian)
2 US Patents, 7 Romanian Patents, 8 patent applications.

Participation in research projects:

	International Projects (selection from 2008)	Position:
8	Graphtivity-Graphene based optoelectrochemical sensor for the simultaneous monitoring of the electrical and chemical activity of single cells ERA-NET (01.01.2016 - 31.12.2018)	Investigator TIRFM, SPR approaches for Biosensing
7	Cell biosensors for detection of chemical and biological threats Contract: NATO SPS 985042 (12.04.2016-12.04.2019)	Principal Investigator TIRFM, SPR Impedance approaches for Biosensing
6	FP7 EC “DYNANO” "Dynamic interactive nanosystems" Project Coordinator: Dr. Mihai BARBOIU, European Membrane Institute -IEM, Montpellier, France. FP7-PEOPLE-2011-ITN - Grant agreement n°: PITN-GA-2011-289033	Team Leader Advanced modeling and SPR approaches for Biosensing
5	TUMORANALYZER – Contract No. 7/RO-CH/RSRP/01.01.2013, Module III Capacities, Response of in vitro hypoxic tumor models to potentially therapeutic compounds as revealed by an advanced analytical platform	Principal Investigator TIRFM, SPR approaches for Biosensing
4	FP7 Protein Aggregation - a quantitative assessment (PROARGUS) Marie Curie Action: "Reintegration Grants" (FP7-PEOPLE-2009-RG)	Researcher supervisor
3	FP7 EC “NANOMAGMA” NANOstructured active MAGneto-plasmonic MAterials Partnership with Consejo Superior de Investigaciones Cientificas, Spain	Principal Investigator Advanced modeling and SPR approaches for Biosensing
2	FP6 *ROBIOS* - Strengthening Romanian Research Training Capacities in Biosensing Contract- INCO-2004-ACC-RSTP	Team/WP Leader

1	FP6 Charpan CHARPAN Contract - IP 515803	Investigator
	National Projects (selection) from 2008	
13	PNRR-III-C9-2023 129/31.07.2023 Towards high-throughput biosensors with increased sensitivity and specificity(BIOSENSE)	Researcher
12	PN-III-P4-ID-PCE-2020-2432 High resolution multiparametric dynamics at single cell level: virus detection by assessing cellular response to viral exposure -DynaScope	Director
11	PN-III-P2-2.1-PED-2019-5185 Rapid, Quantitative Identification of Microorganisms in a lab-chip assay BactoID	Director
10	PN-III-P2-2.1-PED-2016-1137 Dynamic platform for evaluation of endo-exo genous compounds: case study Amyloid β	Director
9	PN-III-P4-ID-PCE-2016-0762 (Light)Driven Dynamics for cell based sensing: a new twist for optogenetics	Director
8	BioScope - Contract No. 11/2012, ID: PN II-ID-PCCE-2011-2-0075 Electro-Plasmonics for the analysis of the dynamics of cellular processes and biomolecular interactions	Partner coordinator
7	Advanced investigations towards medical applications of nuclear Technologies – PROPETHAD (coordinator Institute of Physics & Nuclear Engineering H. Hulubei)	Researcher - microscopy
6	Development of nucleic acid–based biosensors for environmental assessment of some selected warfare agents (BIOSADN) Partner* (coordinator University of Bucharest)	Researcher Biosensing platform development
5	Controlling the interaction between human and bacterial cells onto nanostructured surfaces: strategies to accomplish “intelligent” biosurfaces (NANOINT)	WP leader Electro-optical and AFM assessment of cellular platforms
4	The diagnostic and prognostic relevance of the endomicroscopic aspect of microvasculature in upper digestive premalign or malign lesions -DIAPROGENDO (project coordinator Fundeni Clinic Institute)	Responsabil Proiect microscopy
3	On the role of membrane dynamics and composition in modulating the treatment resistance of tumor cells	Principal investigator microscopy
2	Modelling the intracellular calcium oscillations induced by the pathogenic bacteria E. Coli in renal cells	Principal investigator microscopy
1	The role of membrane lipids in modulating the response of tumour cells to anti-cancerous treatment” - LIPTUM	Principal investigator microscopy

Participation to international conferences and international advanced schools

Invited talks

[**1**]. Electrically modulated microscopy assay for fast high content, label free assessment of cell's dynamics 27 January - 1 February (**2024**), San Francisco, California, United States, SPIE Photonics West

[2]. “Biosensing meets optogenetics: harnessing light driven dynamic processes for cell based bio-sensing” BIOS2018_0748, 28th World Congress on Biosensors, 12-15 June (**2018**), Miami, Florida, USA

[3]. "Electro-Optical flow-through system to appraise cell dynamics", Open Problems in Systems Chemistry January 23- 24, (**2012**), Montpellier, France
[4]. "Advanced electro-optical and SPM approaches in probing and development of cellular platforms for sensing"– International Workshop on Cell Physiology and Biosensors, Hasselt, Belgium, December, 11-12, (**2008**)
[5]. "New avenues, "hot topics" in Biodynsensing", Montpellier (**2006**);
[6]. "On the electrode related problems in bioimpedance measurements", NUS (**2005**)
[7]. "Anti-angiogenesis effect of Somatostatin/analogues: case study – hepatocellular carcinoma" Novartis Young Investigators' Meeting, Barcelona, Spain, Jan. 28-30, (**2005**);
[8]. "Revealing alteration of membrane structures During Ischemia Using Impedance Spectroscopy", Regional Symposium on Membrane Science and Technology, Songkhla, Thailand, (**2003**)

Oral Presentations (selected)

[1]. High content label free assessment of single cell dynamics based on electrically modulated microscopy assays, International Symposium "BIODYNAMICS: A TRANSDISCIPLINARY APPROACH", Bucharest, 19-21 May, (**2022)**
[2]. High resolution electro-optical mapping of living cells for (bio)sensing: case studies on eukaryotic and prokaryotic (bacterial) cells, the 6th edition of International Conference on Analytical and Nanoanalytical Methods for Biomedical and Environmental Sciences "IC-ANMBES 2022" June 8 - 10, (**2022)**, Brasov, Romania
[3]. Towards an integrated automatic platform for rapid determination of antibiotic susceptibility of target bacteria, the 6 th International Conference New Trends on Sensing - Monitoring - Telediagnosis for Life Sciences - NT-SMT-LS (**2022**).
[4]. High resolution Electro-Optical imaging for cell-based (bio)sensing 31th World Congress on Biosensors, 26-29 July (**2021**) Online and On-demand
[5]. Novel bioanalytical perspectives of plasmonic interfaces Molecular Plasmonics (**2017)**, May 18-20, IPHT Jena, Germany
[**6**]. A New Twist for Optogenetics: Light Driven Dynamics for Cell Based Sensing "IC-ANMBES", (**2016**), 29 June-1 July Brasov, Romania
[7]. Advanced electro-optical analytical platform for dynamic evaluation of cell-surface and cell-cell interactions at Biosensors Congress (**2014**), 27-30 May, 2014, Melbourne, Australia;
[**8**]. Dynamic assessment of Amyloid oligomers – cell membrane interaction by advanced impedance spectroscopy XVth Intl Conference on Electrical Bio-impedance & XIVth Conference on Electrical Impedance Tomography, 22-25 April Heilbad Heiligenstadt, Germany (**2013**)

(selected) Poster Presentations

31th World Congress on Biosensors, 26-29 July (2021) Online and On-demand
28th World Congress on Biosensors, 12-15 June (2018), Miami, Florida, USA (2018)
First International Summer Institute on Network Physiology (ISINP) *Lake Como School of Advanced Studies – 28 July – 2 August*, (2017);